with that earthshine stuff.

CAP COM Say again about the earthshine, Bill.

SC We never did have a chance to do any earthshine photography.

CAP COM Roger. Got that.

PAO And so we get a good something of a wrapup on our film situation. Which we have been wondering about now for about a 24-hour period. And at 109 hours 26 minutes the spacecraft 153 504 miles from home, this is Apollo Control Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY 12/25/68 GET 110:05:00 CST 8:56 pm 335/1

CAP COM This is Apollo Control at 110 hours, five minutes into the flight. At the present time here in Mission Control Center, we have just completed a shift change and our flight director at this time is Milton Windler and our capsule communicator is astronaut Ken Mattingly, Apollo 8 at this time is at an altitude of 151,789 nautical miles from earth and it's traveling at a speed of 4,584 feet per second. Since our last report, we have had something under a minute of conversation with the crew, and we'll play that back for you now.

CAP COM Apollo 8, Houston. How are you coming along with your P23 mods.

SC Five balls, they are getting square. What we have been doing most of the day, Ken, have you received the data down below?

CAP COM Roger. Looks like you are getting some pretty good marks. We have a pretty good hack on the vector and the matrix, and looks like if you wanted to terminate at this point, that we do have good data.

SC - try to do stars at one -

CAP COM All right.

SC Did you have a nice Christmas?

CAP COM Apollo 8, Houston. Did you call?

PAO This is Mission Control. At the present time, I understand Bill Anders is flying the spacecraft, occupying the commander's couch, the left-hand couch, and Frank Borman is getting some sleep. The medic advises that he has been sleeping now for about two hours. We expect that shortly Jim Lovell will also begin a sleep period and we would also expect that Frank Borman would be waking up. At 110 hours, 10 minutes into the flight, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 111 hours 6 minutes. Since our previous report, we have had about 8 or 9 minutes of conversation with Bill Anders aboard the spacecraft. It appears that both Frank Borman and Jim Lovell are getting some rest at this time. We will bring you up to date on the conversations that have developed and then stand by briefly for any live conversations with the crew.

SC Houston, Apollo 8. Over.

CAP COM Go ahead, Apollo 8.

SC Who is this? Kenny, or Jerry?

CAP COM Say again, please.

CAP COM This Ken, go ahead.

SC Okay Ken. We are getting back to the PTC attitude. Would you like us to do the test?

CAP COM Affirmative.

SC ... just went to ...

CAP COM EECOM.

CAP COM Okay, Apollo 8. That is fine. That's right, Bill. That was just an ... acquire.

SC Man, we get acquire on the run here.

CAP COM Hey, you are getting good at that.

SC (garbled)

SC Okay, we will keep it here for two revs, Ken. Mike and uh - Mike and Jim are alseep and I'll just keep it going here for two rolls.

CAP COM Okay, real fine.

SC Houston, Apollo 8. Over.

CAP COM Go ahead 8. Go ahead 8.

SC Well, the react didn't work as advertised. We get - went on by the scan limit and into the mechanical limit and followed - this meant around - Looking out of the corner of its eye on wide beam and when Menkent came back underneath the spacecraft, why it snapped back on it to narrow beam. Apparently never broke lock, or if it did it was only instantaneous.

CAP COM Roger. It looked like we did break lock there for about 8 minutes.

SC Two-way lock, but I was still -

CAP COM Roger.

SC Under the scan limit, why I'll go ahead and go the manual and auto lock on sequence and switch over to react and see what it does next time around.

CAP COM Roger.

SC Houston. Were you able to get high bit rate from the omni's now, by the way?

CAP COM Apollo 8. Houston. The omni high bit rate capability is noisy, but usable.

SC Okay. I think what we'll do here is if I see the high gain definitely going past the scan limit before it gets to the mechanical limit, I'll go ahead and ask - you could ask if the react feature hasn't taken over I'll just go ahead and shut it down .... stops.

CAP COM We are talking about it now, Bill.

SC Okay. But my understanding is that the scan warning of this thing is supposed stop tracking and it uh break of lock, for example, not very big.

CAP COM Roger. That's my understanding, but we are talking about it right now. I'll let you know in just a second.

SC Probably, Ken, we are not ever losing the earth's present signal.

CAP COM That's correct. Hey, Bill. Can you tell us what angles this went through. The curves that we have plotted is apparently the RF limit rather than the mechanical limit and discussing the function of the AUTO react mode, it looks like it is supposed to shift when it hits the RF limit, which is your - should be your inner set of numbers as opposed to the scan warning limit and if it went inside of that number, could you tell us about what kind of numbers it did go into.

SC Roger. It went past the caution warning limit to RF limit.

CAP COM Okay. Say for it me so I can copy it.

SC The antenna went to about 330 to 270 yaw plus 60 80 pitch.

CAP COM Roger.

SC Okay. The HEC dropped off to what I call our noise level that was the voltage integrated when the noise broke in. It was about 11 o'clock ... beam switch and a couple of times dropped to ... very briefly.

CAP COM Okay, you got some larks on that AGC that should register in volts, I believe. Do you have an indication other than 11 o'clock?

SC Unfortunately, the numbers never got on here. If you will look on that chart that Fred Hayes has, it ... 11 o'clock position. I might have it on my systems --

CAP COM Bill, --

SC -- when the antenna - when the antenna did snap back in, it went into yaw 80, pitch minus 5. With Verb 64 reading plus 67 for yaw and minus 10 for pitch.

CAP COM Okay. Yes, copy all that. I think you would have 4 or 5 marks on that power meter, don't you. From what you are saying, I take it, it's between Marks 2 and 4.

SC yes. Stand by a second.

SC Stand by Ken. I'll tell you what that mode is.

CAP COM Thank you.

SC Okay, it went to about hovering around 2.4 to 3.

CAP COM Okay, thank you. Roger. Apollo 8, Houston.

SC Go ahead.

CAP COM Okay. It's not real clear that it did in fact, get to the mechanical stop and if it does, the back room people say we can stay up against that stop for a maximum of 15 minutes without doing any damage. And we would kind of like to track it through one more time as is. We do have the high bit rate capability on omni. So we would like to follow through that same configuration for one more rev.

SC Well, since we are not sure that it did get up against the mechanical stop last time for 10 minutes or so, I don't think it would be too smart to ... position.

CAP COM I am sorry, Bill. You didn't come through. Say again, please.

SC Since we are not - it is not clear to me that we went up against the mechanical stop for a while on the last time around, that might account for 10 minutes of that 15 minutes and it would be pushing our luck - dropping it back where it belongs. We are still a long ways from home and if that antenna switch fails, it's going to fail the high-gain position and that's all we got.

CAP COM Roger, Bill. And we will be making a handoff on stations at 5 5.

SC Ken, we are going to switch COMM carriers here a second.

CAP COM Okay, thank you. Okay. Apollo 8, Houston. Through Honeysuckle.

SC Roger. Read you 5 by.

CAP COM Thank you.

SC It did the same thing that time, Ken. This time the voltage AGC did drop to full scale low for several seconds, but the antenna does seem to indicate it can look right through the spacecraft and on your D the earth went where the antenna was not supposed to be able

SC to go.

CAP COM Okay. I would just like to confirm with you that it never did go back to the preset numbers.

SC No, it apparently never lost earth presence signal. It sounds like it was trying to pick up one-way lines all the time and we usually hovered around 2 volts AGC except for brief periods.

CAP COM Okay. Thank you very much.

SC It looks like if they had - should have not had the ... switch into wide beam until after it had gone to those preset limits. We are back in AUTO on the omni.

CAP COM Okay. Thank you.

SC - CDR is up and manning the helms. We are going to switch COMM carriers. That will be all up here for a little bit.

CAP COM Okay. Thank you.

END OF TAPE

73/8

SC Hey, Ken this ~~is~~ Frank.
CAP COM Good morning, sir.
SC Houston, Apollo 8.
CAP COM Go ahead Apollo 8, loud and clear.
SC How far are we from home, Ken?
CAP COM Oh, about 152 it looks like. That is pretty gross, I will get you a real number in just one minute.
SC 152?
CAP COM 148,550. That is a good number.
SC Pretty good.
CAP COM A velocity of about 4650.
SC Increasing it.
CAP COM That is affirm.
Pause
PAO This is Apollo Control at 122 - rather 111 hours 22 minutes and at the present time we are standing by for a status report - a crew status report which we anticipate to be coming up from the crew shortly. In that past conversation we heard from Frank Borman for the first time in about three hours and we should be getting a report in that crew status summary from Frank on just how much sleep he did get. We will continue to stand by for that call to the crew from capsule communicator, Ken Mattingly.
Pause
PAO This is Apollo Control and we have been advised that, that the crew status report will probably be a little bit delayed in coming. At the present time Borman is scheduled to be eating and we plan to wait until sometime after he has had a change to complete his eat period before requesting that status report. At the present time Apollo 8 is traveling at a speed of 4,657 feet per second and our current altitude reading is 148,210 nautical miles. This is Apollo Control, Houston.

END OF TAPE

CAP COM This is Apollo Control at 111 hours, 35 minutes. At the present time, we are in communication with Frank Borman aboard the spacecraft. Frank has just advised us that he is the only one up at the present time. A short time before that, Bill Anders came on and said that he planned to get a little bit of sleep and requested permission to take a Seconal tablet, one of the short-acting sleeping pills carried aboard the spacecraft, and was given a go-ahead to take a tablet. And we also received a crew status report from Borman and he reported that all three crewmen had eaten three meals today, said they had been drinking a lot of water, and had used the exerciser, and in general summed up their condition as being quite good at this time. We will pick up that conversation and play back what tape we have accumulated, and then follow whatever live conversation is going on when the tape is through.

SC Houston, Apollo 8.

CAP COM Go ahead, Apollo 8.

SC We tried to get back on our normal sleep cycle, and I just woke up here a little while ago, so I'm going to try to hit the hay again, probably be a good idea to try another Seconal to try to get with it. What do you think down there?

CAP COM Okay, sounds like a good idea. And if we can get Frank to tell us how much sack time he got, that will go in the log too.

SC I was in bed for seven hours, Ken, and I probably slept for about four and a half to five hours of it anyway.

CAP COM You're getting better. Good.

SC If you're interested in further reports, we've all had three meals today, and we have drunk a lot of water, and Jim is asleep now, he worked pretty hard this afternoon, but I think we are all in pretty good shape now.

CAP COM Real fine. Thank you.

SC We used the exerciser. Well, Ken, that just leaves you or I, how about you and I, anything exciting happen today?

CAP COM I think you know about all the things that are exciting up on your end of it, real quiet down here. Everybody is smiling, Santa was good to most of the folks in the world, and everything is pretty calm, like it should be on Christmas.

SC Very good.

CAP COM Milt there is in a period of relaxed vigilance.

SC Very good. We relax, you be vigilant.

CAP COM That's a fair trade.

SC Hey, Ken, has anybody got any good idea

why that quad A tank is running hot, hotter than the rest of the quads?

CAP COM Okay, I didn't have an answer when I came on, just a second and I'll check again.

CAP COM Apollo 8, Houston.

SC Come in, Houston.

CAP COM Okay, Apollo 8. Let me tell you what subject matter we're going over down here; number one, we're making a review of all the entry procedures and that type of information, I mean we're actually going through and reviewing the entry check list. We have people that are still working on verification of your erasable memory, and we are looking at the EMS problem, and we're discussing the quad temperature, so I'll feed up some of these pieces of information as they come along, and right now we are just sort of having a status review.

SC I don't think the EMS is much of a problem, it just jumps when you go into auto. I don't believe it will bother us on entry. I don't remember the EMS doing the same thing - I am just going over my check list - one of the first things I see here is a coldsoak, and I don't think we want to evaporate between the last midcourse and entry, do we?

CAP COM This is Apollo Control. In that previous conversation with Frank Borman, we heard Cap Com Ken Mattingly review activities here in Mission Control Center, including a comment on the quad temperatures, these are the temperatures in the reaction control system, the engine quads, of which there are four in the spacecraft service module, and we have been observing the temperature of quad A for several hours now. That quad is running about 83 degrees compared with 60 or 70 degrees for the other three. The assessment here in Mission Control Center is that that is not a problem. There is no explanation as to why that one quad is somewhat higher than the other three, but we don't consider it any problem. At the present time, the spacecraft velocity is 4,675 feet per second as we continue to watch the gradual buildup in velocity and a gradual decrease in altitude. Our altitude reading at this time is 147,321 nautical miles. At 111 hours, 45 minutes into the mission, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, Houston, at 112 hours, 19 minutes. Apollo 8 is at an altitude of - 145 758 nautical miles and traveling at a speed of 4709 feet per second. Since our previous report we have about 6 or 7 minutes conversation with Frank Borman aboard the spacecraft. He reported that his cabin temperature was running a little bit higher than normal, about 80 degrees at the present time and indicated that apparently the higher temperature is due to the fact that current spacecraft attitude allowed more sunlight into the windows. We'll play back the tape of that conversation for you. We're expecting a call through the crew shortly from CAPCOM Ken...and we'll standby after we catch up to pick up any live conversation.

CAPCOM Apollo 8, Houston. Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Roger. Looking at the flight plan you have a P52 coming up at a 115 hours and we'll have to do another one at 11945 preparation for the P23. And it's acceptable with the ground procedures if you would like to delay about 115 hour alinement and do it just once at 11945 or you can do it there in flight plan location. If you want to skip the 115 hour alinement, we could go ahead and start in on the 15 YAW free PTC load at this time.

SC What does that mean, Ken?

CAPCOM Okay, we have a DPO that requires that we do a PTC and go ahead and do it in minimum impulse load so that we're not putting any attitude corrections in. And we're going to be tracking the attitude excursions. And they want this something like 6 hours or until we reach 11.

SC Roger. The temperature is running a little bit warmer than normal.

CAPCOM I'm sorry, say again.

SC I say the cabin is running a little bit hotter than it has been. It looks like this particular PTC alinement gets more sun in the cabin.

CAPCOM All right, what kind of temperature are you recording right now?

SC I just put the window shades up that will cool you off.

CAPCOM Okay.

SC You won't be there to take the pitch YAW out of - brake fan, right?

CAPCOM That's affirmative. You just put it minimum impulse and then we'll watch it.

SC There you are.

CAPCOM Okay, thank you.

SC Have fun.

CAPCOM Roger. And I'm at quad temperature. The upper limit of that thing is 105 degrees on the bottle.

You are well below that. We have been watching it and it is tracking although it is tracking very slowly as you pull the spacecraft the temperature seems to be a little sluggish. But it isn't a frozen censor. And talking a little bit more about that one right now - You might tell Jim the next time he goes to work with the optics...when you work with the trunnion if you'll go ahead and recycle the zero switch you can avoid the problem we had prior to midcourse correction four. And the midcourse correction - the midcourse correction number six right now looks like zero. And midcourse correction seven is approximately 2 feet per second.

SC Okay, Jim, now we've got an inject list to initiate cabin cold flow. This involves evaporating and I don't think we want to do that.

CAPCOM Okay, now we talked that over with... and at 12 hours out everyone seems to think that we don't need to do it there. But in close it doesn't seem to have any effect on the trajectory and what's been suggested if you'd like we can go over the entry checklist and just kind of walk through it on the air with all the people on the console. Right now you have the team that will be performing the entry session with you so we can go over the checklist and run down any corrections that you might have. It's left up to you.

SC That's fine, let's do that. I've got one right here...

CAPCOM All right, give us a few minutes to pull ourselves together and get on the air.

SC Go ahead.

CAPCOM Okay, we've drifted off now about 25 degrees in PITCH. I'd like to have you take it back and set up the PTC plane again at PITCH of 10 and YAW 45 and set up the PTC under control and turn your ship back to minimum impulse and give us a mark when you have done that. And we'll time the drift rates down here.

SC Okay. Okay, Ken, I've got them all stamped out about as low as I can get them.

CAPCOM Okay, fine.

SC I'll put in a ROLL right now.

CAPCOM Thank you.

SC I'll put in a ROLL right now.

CAPCOM Thank you.

SC Takes actuations to get about a degree and a half or a tenth - one - . 15 degrees per second.

CAPCOM All right. And giving a mark when you release the break command and pitching out.

SC I haven't even got them on.

6 352/1

APOLLO 8 MISSION COMMENTARY, 12/25/68, GET 1121900, CST 11:10P 339/3

CAPCOM Oh, okay, fine.
SC When I gave you - when I gave you that mark that was it.
CAPCOM Real fine, thank you.
SC Ken, be sure and call me if you see any gimbal angles start to get near arc or anything gimbal ... I'm a little drowsy still. I don't want to end up with another no attitude like one is enough.
CAPCOM Roger, will do.

END OF TAPE

PAO This is Mission Control. There doesn't appear to be any further conversation developing at this time. We do have some figures for you. On the half way point in the spacecraft's return to earth, we anticipate that that will be reached at a time of 126 hours 3 minutes 9 seconds in the flight. At that point Apollo 8 would be 103 002 nautical miles from earth and would be traveling at a speed of 5870.6 feet per second. At 112 hours 31 minutes into the flight, our velocity is 4720 feet per second and the spacecraft at this time weighs 31 649 pounds. Current altitude reading is 145 208 nautical miles. This is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 112 hours, 58 minutes. At the present time both here in Mission Control Center and aboard the spacecraft it's a relatively a quite period. Frank Borman continues to be the one of the three crewmen who is awake at the present time and he's reported on a couple of occasions that he is getting sleepy. Eariler, Frank reported, that he had gotten about four and a half to five hours of sleep and had been in the sleep station for about seven hours. Since our previous report we've accumulated about five minutes of tape conversation. We play that back and continue to stand by for any live comments from Borman aboard the spacecraft.

CC Apollo 8 Houston

SC Okay, would you reinitialize the PTC attitude and try it one more time?

CC Okay.

SC Okay.

CC Roger. Say that again, please.

SC Say, that's getting pretty good now.

CC I think it's getting freezing up there, huh?

SC Okay, would you believe that the north beat the south three to nothing, and they did that all with a first quarter field goal.

SC How about that, Eddie.

CC Yes, sir. And Frank we're going over a check list right now and I'll get back with you on the entry check list in a few more minutes.

SC Roger. We're flying a train very badly.

CC Okay, I noticed that on PV.

SC I'll tell you one thing we are going to do on these suits, we're going to stow them, one under each seat the way North American suggested.

CC Roger. And you'll be putting the helmets in the food storage.

SC Yes, I think we'll put the helmets in the food storage and any stuff we have to take out of there, we'll just stick in a suit.

CC Okay.

SC Is the weather still good our there?

CC Its not quite as clear as it was yesterday, it sure is nice and balmy.

SC (garbled) 165 west.

CC Okay, Frank, we've got a weather picture here. The forecast shows 2000 scattered and 4000 broken with a high overcast, you might see that as you come down to it and way height four feet when by 070 at 12 with 10 miles visibility and perhaps some scattered showers in the

miles visibility and perhaps some scattered showers in the area and this is forecast for 27th and 16 other Zulu.

SC Very good, we'll be there.

CC Yes, I'm sure you will

SC (static) about 45 minutes ....

CC Okay, we'll put in a kit for some small waves.

SC Tell Jerry Hammack if the waves get high its his fault.

PAO This is Mission Control, apparently a small segment of Borman's remarks during that past conversation was at a low enough level that they did not trip the recording mechanism for a release circuits. We will have those on a backup tape that will be included in the transcript. Generally, those remarks consisted of brief comments on anomalies encountered. Borman summarized about four or five items that constituted minor problems and I'll run through those for you now. He mentioned that the inflight coverall booties that the crew was wearing had become frared and that they had removed them, he also mentioned that one of the Y adapters associated with their electrical umbilicals had developed an open circuit and he said the light weight head sets that they carry onboard had not proved very useful but that the snoopy hats of the helmet type arrangement with the communications equipment inside the headset was quite comfortable and that the crew was wearing those all the time. The following remarks, I believe, did appear in the tape release was concerning the plan to store these suits and but - helmets, storing the suits under each seat at reentry and the helmets in the food storage area. At 113 hours, six minutes into the flight our displays in Mission Control Center show that the spacecraft has an altitude of 145 319 nautical miles and its volicity 4718 feet per second. This is Apollo Control Houston.

END OF TAPE

CAP COM Apollo 8, Houston.
SC Go ahead, Ken.
CAP COM Okay, would you re-initialize the PTC attitude and let's try that one more time.
SC Okay. Are you ready.
CAP COM Okay.
SC Okay, three blips.
CAP COM Thank you.
SC There she goes.
CAP COM Roger.
SC Is it sleepy out down there too?
CAP COM Say again, please.
SC I say, is it sleepy out down there.
CAP COM No, it's getting pretty good now. I figured it's getting sleepy there - not not -
SC yes.
CAP COM Okay, well would you believe that the North beat the South 3 to 0. And they did that all with a first quarter field goal.
SC Very good and when was the East West game?
CAP COM Oh, about Saturday.
SC Next Saturday?
CAP COM Yes sir. And Frank we are going over the check list right now and we will get back with you on the entry checklist in a few more minutes.
SC Okay, Jim. I think it is pretty good one, but that is one thing we have practiced a lot. Why don't you let everybody know what we are doing.
CAP COM Roger.
SC Ken, while we are just killing time here, there are a couple of anomalies we noticed on the booties, you know, for the inflight coveralls. Mine have frayed very, very badly and I have taken them off. Also we had one Y adapter with an open end and the lightweight headsets were kind of useless.
CAP COM Roger.
SC I take that back. I really didn't mean to say that. The lightweight headset - what I really meant to say was, the lightweight headsets are useless.
CAP COM Okay.
SC But these snoopy hats are pretty comfortable. We have worn them the whole time.
CAP COM yes, I noticed that on TV. Ken, one thing we are going to do on the suits, we are going to stow them, one under each seat, the way North American suggested.

CAP COM Roger. And you don't be putting the helmets in food storage.

SC Yes, I think we will put the helmets in the food stowage and any stuff we have to take out of there, we will just stick in the suit.

CAP COM Okay.

SC Is the weather still good out there.

CAP COM Oh, it is not quite as clear as it was yesterday, but it sure is nice and balmy.

SC no, I mean out at 165 west.

CAP COM Okay Frank, we have got a weather picture here. The forecast shows 2000 scattered and 12 000 broken with a high overcast. You might see that as you come down through it and wave height, 4 feet, wind about 070 at 12 with a 10 mile visibility. And perhaps some scattered showers in the area and this is forecast for the 27th and 1600 zulu.

SC Very good. We will be there.

CAP COM Yes, I am sure you will.

SC i will make those waves ... We are going to sit in this thing for about 45 minutes.

CAP COM Okay, we will put in a kit for some small waves.

SC Tell Jerry Hammack, if the waves get high, it's his fault.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET 1134000, CST 12:31A 342/1

PAO This is Apollo Control, Houston at 115 hours, 40 minutes. We've had a very quiet period here in Mission Control since our previous report. One very brief exchange between the ground and Frank Borman. We show virtually nothing in the flight plan for the next two hours as both Anders and Lovell are continuing to sleep. They have now been sleeping or resting for about 3 hours and Lovell perhaps maybe an hour longer than that. He indicated that he was beginning his rest period about an hour before Bill Anders came up and indicated that he would also try to get some sleep. Here is the conversation that went on a short while ago. We'll play that back to you now.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Okay, why don't you drive it back over to the PTC attitude and put it back into attitude hold for the ROLL. And we're going back in and review the DTO requirement. You have about the same results it looks like on a cursery analysis all three times. So we're going to take another look and see if there is any reason to do it again. If so, we'll call you. You can go ahead and put it back in attitude for now.

SC Okay, Jim, thank you.

END OF TAPE

PAO This is Apollo Control at 114 hours 6 minutes. At the present time, our spacecraft is traveling at a speed of 4817 feet per second and our altitude now above the earth is 140 780 nautical miles. We have had very small amount of communications with the crew since our last report. We will pick that up for you now and then stand by for any further conversations that develop.

SC Houston, Apollo 8. Radio check.

CAP COM Loud and clear, Apollo 8.

SC Okay Ken. Thank you.

CAP COM Roger. It is taking us a little longer to go through and rehash all of the entry tickler than I thought and we are just about to wrap it up now.

SC No problem. Just watch my gimbal angles for me and give me a call if they get too close.

CAP COM All right. We will watch them.

END OF TAPE

PAO This is Apollo Control at 114 hours, 21 minutes. CAPCOM Ken Mattingly has just put in a call to the crew. We'll pick that up for you at the beginning.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Say, we would like to look at a couple more DELTA-V tests on the EMS and the general concensus is that we don't think there is any particular problem. We'd like to go ahead and take a look at what you get by running four or five more DELTA-V tests in private. We'd like to run one of these null bias tests and since we don't have any way of monitoring any of this stuff on the downlknk, I'd like to have you tell us each step when you turn the switch and different orders and things like that.

SC All right, I'll run a test.

CAPCOM Okay, the first thing we want is this null bias a hundred seconds. Affirmed.

SC DELTA-V.

CAPCOM Roger.

SC I took some minus 4, 24 that is.

CAPCOM Roger.

SC Minus 25.

CAPCOM Roger.

SC Minus 26. Minus 27, and there is a 106, minus 27 and 106.

CAPCOM Roger.

SC Now what do you want?

CAPCOM Okay, if we go back and both switch to standby and function switch OFF.

SC Roger.

CAPCOM Okay, now we'd like to do a couple of DELTA-V soft tests.

SC Okay, 7 to 1586.A.

CAPCOM Roger.

SC Have you gone to automatic?

CAPCOM Roger.

SC Want a DELTA-V test? Now, counting down.

CAPCOM Apollo 8, Houston. Apollo 8, Houston.

SC You back, Ken.

CAPCOM Apollo 8, Houston.

SC Roger, read you.

CAPCOM Okay, we got caught in a space and hand' over there. This copy may be empty, you said you were putting it to DELTA-V test.

SC I ran three tests during that hand over.) over minus 19.6 2R minus 19.8 one of them minus 19.6.

CAPCOM Okay, that sounds real fine.

SC Roger.

CAPCOM Okay, the other thing that sometime prior to entry and we're going to be looking at it is the normal entry test pattern and it's called out certainly in the checklist as something we do around an hour and we'd like to check if you can read the number on the scoll that is up now so we can see where we are in the test pattern sequence. We're considering taking a look at these test patterns before we get into an R so we can have more time to think about it in the event that there should be something anomalous in it.

SC Why don't we do it right now? We're on number 8.

CAPCOM Okay, understand that's number 8, right?

SC Roger. It takes an awful long time to run them over there anyway. It won't hurt to do one.

CAPCOM Okay, if you'll standby here for just a second. We're checking to see where we stand in the sequence of events for pattern 8.

END OF TAPE

CAP COM uplink signal. So if we put it on at this point, we know we have it on well in advance of any time we might be able to get into VHF.

END OF TAPE

SC Hey, Ken.
CAP COM yes sir.
SC Another little thing about this EMS. You know, we had it set up when we separated from the booster -
CAP COM Roger -
SC - and the shock of the separation - the shock of the pyro's blowing in separation knocked it up to 100 and something.
CAP COM Understand, knocked it up to 100.
SC Roger.
CAP COM Was the pyro separation enough that the - you felt a sensable G in the bird?
SC Roger. Let's just say there wasn't any question ...
CAP COM Roger. Understand.
SC While you are checking the scroll ... find out which drifting pattern I should be using on this bird.
CAP COM Okay, will do.
PAO This is Apollo Control. During the past few minutes the conversation has concerned the ENTRY monitoring system. We have been running some tests on this system to - stand by here is a call to the crew.
SC Go ahead.
CAP COM Okay, we are verifying that scroll position. They are talking it over in the back room about that now. I would like to go ahead and run down the checklist with you for entry.
SC Go ahead.
CAP COM Okay, look in on entry 1, the second item there is 12 hour Kevin cold soak and in discussions here and preflight, I think it is agreed that we don't want to do the cold soak there. So we are going to delete that step 2. And what it amounts to is, I think we do want to do a cold soak and we certainly want to exercise the water boilers prior to entry in order to insure that we don't have one that is dried out, in the same manner that we had one dried out prior to LOI. And we are working on some procedures for that and wanted to come back to you with those a little bit later and we will try to do it sometime when Bill is on the line. So that everybody can get in on the loop at the same time. We would like to add a step between 8 and 9, or as part of step 8. This is all on page D-1 where we turn the VHF to SIMPLEX A at minus 4 hours and 35 minutes. Now, this will be beyond two-way VHF range, but it will make sure that we do have it on at the time when we pick it up. We were able to get out to 20 000 miles with it downlink and we are checking on the

CAP COM uplink signal. So if we put it on at this point, we know we have it on well in advance of any time we might be able to get into VHF.

END OF TAPE

CC If we put it on at this point we know we have it on well in advance of any time that we might be able to get into the VHF.

SC Okay.

CC Okay, I guess maybe I have that backwards - they copy - you folks copied the VHF out to 20 KM, we're checking on the - on the downlink, end of that now, but in any event this four hours and 35 minutes will get it well in advance for that.

SC Roger

CC Okay, 8, we just had an answer back on the test patterns, we thought it was - we had 25 test patterns that you're allocated at the ground test and these are the ones we've been looking at. Then there is five more than is allocated to flight and the only difference in these patterns is that the flight patterns have instructions actually written on them so if we are looking at test pattern eight that means that we're still working on the ones that you were allocated on the ground test, so there was no problem there and I'll get you a number for which pattern we will be using for entry, we're working on that one right now. So we would like to go ahead and run through these.

SC ...

CC Say again, Frank.

SC I don't mean the test pattern, I don't mean the test pattern, we ask them to put the supercircular on the number - the first place on the scroll and I'm sure they did, I'm sure its the first pattern but I just wanted to make sure that's right.

CC Roger, that's why we are trying to verify it - so -

SC You want me to run through a test pattern.

CC Yes, sir, do it please. And if you'd tell us each step as you go through it.

SC Okay, going through step one, EMS step one, wait five seconds, five seconds going auto, okay, indicator lights are all off, the range is zero, zero. I'm gonna slew the hairline over the notch. Okay, and now we go EMS test two.

CC Roger.

SC Got the 05 G light, all others are out.

CC Roger.

SC On test three, far side lower light on ten seconds, going to set your range counter to 58. Okay set at 58, going test four.

CC Roger

SC Beautiful, its perfect, its right in